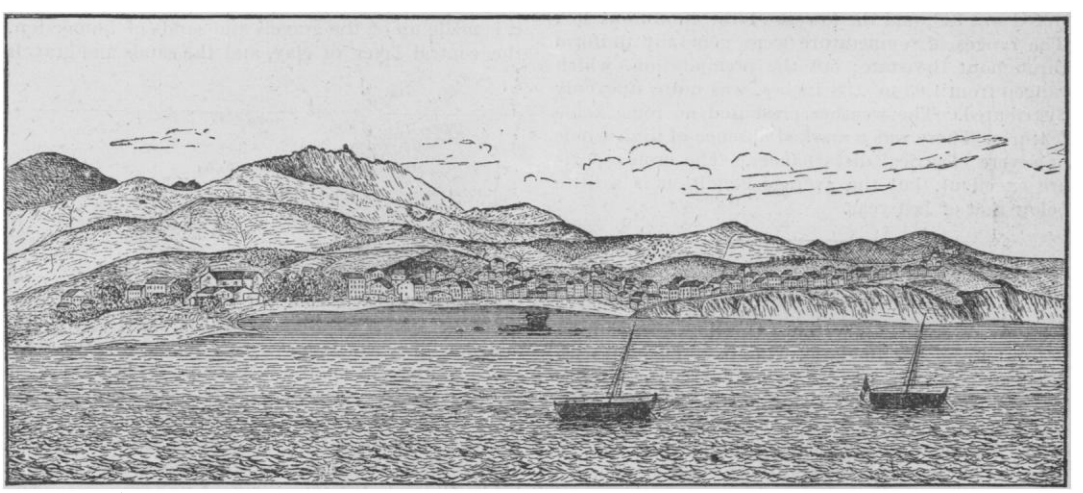
the region, with a lateen-sail, but considerably larger for long voyages. This boat is commanded by an experienced fisherman of Banyuls, who is conversant with the whole neighboring coast.

The almost entire absence of rise and fall of the water at Banyuls at first puzzles a collector of marine animals accustomed to searching the rocks bared by the receding tide: but one soon finds other and equally productive modes of shore-collecting; while the very absence of great variation in the level of the water enables one to moor boxes of embryos along the inside of the breakwater, and watch their development at leisure.

The expenses of living in Banyuls are about what they would be in a village of the same size on the New-England coast; but the laboratory, like that at Roscoff, is free, requiring for its use only the permission of Professor Lacaze-Duthiers. Reagents, microscopes, mounted dissecting-lenses, glassware, and all other necessary apparatus, are furnished free, the only cost being a small fee paid to the janitor for the care of rooms. While, in all probability, preference would be rightly given to Frenchmen, in case there were more applicants for places than there were rooms, yet foreign investigators will undoubtedly play an important part in the laboratory at Banyuls, as they have already done in that at Roscoff, and will return to their native countries vividly impressed with the liberality and devotion to science shown by Professor Lacaze-Duthiers.

GEO. DIMMOCK.



BANYULS AS SEEN FROM THE LABORATORY.

AUGUST REPORTS OF STATE WEATHER-SERVICES.

THE states in which organized weather-services exist have issued reports for August which give in some detail the results of the observations. The special feature of the month in the majority of states seems to have been the lack of rain, and the consequent drought.

Georgia. — The temperatures ranged from 47° to 98°: the mean was 79°.3. The rainfall ranged from 1.01 inches in the south-west to 9.15 inches in the south-east. The general drought of the summer was unbroken. The cotton and corn crops do not average 75 % of the usual yield.

Indiana. — Thunder and lightning were unusually prevalent, but the rainfall was at least one inch less than the average. The temperatures were lower than usual, and light frosts were reported on the 24th and 25th. The pressure was nearly normal, with a small range.

Iowa. — "The month was cold, clear, dry, with north-westerly and south-easterly winds equally frequent, and calms numerous." The low mean temperature, 2°.5 below the normal, is mainly due to the first decade; but in this period the sunshine was especially intense. The number of fine days, and the dry, sunny weather, have been favorable to the crops. Frosts were recorded on the 22d, 23d, and 24th. There was a very severe hail-storm on the 7th, extending from Sac to Cass counties.

Missouri. — The mean temperature was below the normal, at St. Louis 2°.3 lower. The rainfall was less than the average, the amount at the central station in St. Louis being not much more than half the usual quantity. The heaviest rainfall was on the southern border of the state. In consequence of the continued drought, the crops have suffered much. A few wind and hail storms were reported.

Nebraska. — There are thirty-one observers, from whose reports it is found that the temperature and rainfall were about normal. The average mean temperature was 75°.4; average rainfall, 3.43 inches. The highest of the maximum temperatures was 93°; the lowest of the minimum, 47°. A violent hail-storm occurred on the 8th, at Lincoln; and a wind of forty four miles per hour, from the east, was noted at North Platte.

Ohio. — The barometric pressure was unusually steady, the small range of 0.542 inches being noted. The mean temperature, 68°.2, is more than four degrees below the average. A minimum of 39° was noted. Rain fell on seven days only. The average rainfall was only 1.88 inches, the usual amount being 3.47 inches. At Lebanon 4.60 inches fell, and at Granville 0.70 inch. A violent storm of wind and hail visited Wooster and vicinity on the 28th.

Tennessee. — The reports are from thirty-five stations. The highest of the maximum temperatures noted was 94°, and the lowest of the minimum 43°. The ranges of temperature were generally uniform throughout the state; but the precipitation, which ranged from 1.03 to 6.38 inches, was quite unevenly distributed. The weather presented no remarkable features. There was a marked absence of high winds or severe electrical disturbances. The crop reports are excellent, but the average condition is a little below that of last year.

THE GEOGRAPHIC CONTROL OF MARINE SEDIMENTS.

M. A. RUTOT, conservator in the Royal museum of natural history of Belgium, who, in connection with M. E. Van den Broeck, has been studying the tertiary strata of his country, has lately taken up (*Bull. mus. roy. hist. nat. Belg.*, ii. 1883, 41) the fruitful subject of the immediate dependence of fragmental marine deposits on geographic conditions, such as distance and form of shore-line, depth of water, currents, etc., and the consequent changes in these deposits following changes in the controlling geographic surroundings. The matter is properly treated deductively, and so far as concerns vertical oscillations of the earth's crust, which determine advance and retreat of the shore-line, it is examined with much detail. The conclusion is reached, that the frequent changes from gravels, through sands to clays, and back again to gravels, that characterize the Belgian tertiaries, can be fully explained by simple, assignable, and slow geographic causes. We have only to regret, that, in the forty pages devoted to the subject, more room was not found for mention of what others have done in the same direction. The method of investigation may be outlined as follows: —

There is first given the familiar illustration of the varied deposits forming off shore at any single time, showing that the texture, and, in part, the composition of the deposits, are functions of the distance from the shore-line, as in fig. 1. Now, let a general depression slowly take place, by which the sea will advance over the land: the whole set of deposits shifts with the shore, until sands, and at last clays, are laid down over the first gravels, as in fig. 2. Then, if elevation replace the depression, the set of strata shifts seaward, and the sands, and at last the shore-gravels, lie above the clays, as in fig. 3. It is generally noted that the upper gravels are finer than the lower, as the later deposits are made, in part, by working over the older during the time of emergence.

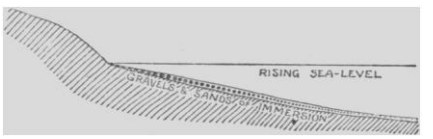


FIG. 1.

The complete set of deposits formed during such a double oscillation of sea-level is to be considered in two ways, — first, with regard to the vertical sequence of the strata; second, with regard to their horizontal equivalence. The vertical sequence is seen in fig. 4: it is made up of the gravels and sands of immersion, the central layer of clay, and the sands and gravels

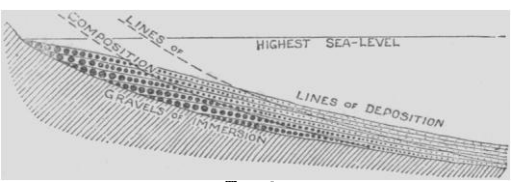


FIG. 2.

of emersion, each stratum having its appropriate fossils. Such 'circles of deposition,' enlarged by the addition of a limestone at the time of greatest distance of the old shore-line, occur several times in our Appalachian sections; and the recognition of their meaning, especially in Professor Newberry's luminous writings, has thrown much light on the evolution of our country. M. Rutot gives the accompanying figure (5) to illustrate the succession of unequal or incomplete oscillations: it shows, I., a large and complete

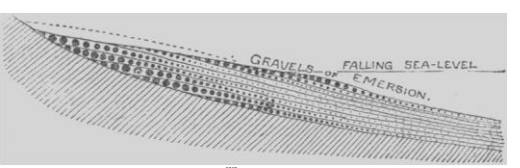


FIG. 3.

oscillation, partly eroded before II., a second depression, from which the elevation was incomplete; III., a great depression and complete elevation; IV., a moderate depression and elevation. This complicated succession represents perfectly the type of the Belgian tertiaries; and the deductions from its physical features are fully confirmed by the evidence from its fossils.

The second consideration, involving the horizontal equivalence of the different strata, is perhaps the most suggestive part of the paper. It is of much importance, and is seldom sufficiently treated. It